Screencast: 23-apache-hands-on.webm or 23-apache-hands-on.mp4

Goals for this hands on (aka Homework 5)

We are going to do a few of the most common Apache configuration changes:

- Verify that apache (httpd) is installed and running
- We are going to enable user directories which allows users to create a directory within their home directory that apache can access with a ~username reference (Example: http://www.cs.montana.edu/~sdowdle)
- We are going to create a virtualhost as an example of a single apache server hosting multiple domain names
- Lastly we are going to install PHP and make sure it is working with apache

All work is done on your own student VM. Note, when you see "*xx*" or "lastname" below, you'll want to alter the content to reflect your own information.

Getting Started

Is apache installed? (`rpm -q httpd`) If not, install it
`dnf install httpd --refresh`

Is it set to run? (`systemctl status httpd.service`) If not, set enable it (`systemctl enable httpd.service`).
Is it running? (`systemctl status httpd.service`) If it isn't running, start it. (`systemctl start httpd.service`)

Verify your web server is working from the course server (links http://kvm-dowdle) [your name]

Refresher on firewalld
Did it work? It shouldn't have because we have not opened up our VM's firewall yet.
`firewall-cmd --list-all` (shows what's open so far, shouldn't see http or https yet)
`firewall-cmd --add-service=http ; firewall-cmd --add-service=http --permanent`
`firewall-cmd --list-all` (Look good now?)

Try again (from the course server):
links http://kvm-dowdle [your name]
Working now?

What showed up?

Look at `/etc/httpd/conf.d/welcome.conf` and do what it says to disable the welcome page.

Restart apache (`systemctl restart httpd`)

Now browse to it again (links http://kvm-dowdle) [your name]

What changed?

Create an index page for your DocumentRoot:
`nano -w /var/www/html/index.html`
Put inside of it "This is the web page for the default domain".

UserDir

Make a backup copy of your `/etc/httpd/conf.d/userdir.conf` file. Do NOT end the backup filename in .conf or it will still be used by Apache.
Edit the `/etc/httpd/conf.d/userdir.conf` file. Find the line that says:
`UserDir disable`
...and add a # to the front of it. Find the line that says:
`#UserDir public_html`
...and remove the comment.
SELinux Booleans that need to be changed:

```
getsebool -a | grep httpd
```

Need to enable **httpd_enable_homedirs** and **httpd_read_user_content**

```
setsebool -P httpd_enable_homedirs on
setsebool -P httpd_read_user_content on
```

Restart apache (`systemctl restart httpd.service`)
Now create a public_html directory in one of your user directory as your user
`mkdir /home/lastname/public_html`
Make sure the permissions on your user's home directory are at least 711.
Make sure the permissions on the `public_html` directory are at least 755.
Create an `index.html` page inside of `public_html`.
Browse to it:

```
links http://kvm-lastname/~lastname
```

VirtualHost

We will create a fake (i.e. using `/etc/hosts` for DNS resolution) host / domain named www.testdomain1.com.

Edit the `/etc/hosts` file and add the following line:

```
192.168.122.1xx       www.testdomain1.com          testdomain1
192.168.122.1xx       kvm-lastname.localdomain     kvm-lastname
```

You can find your ip address by looking at the output of the following command as root on your student VM:

```
ip add
```

Or by looking in `/etc/sysconfig/network-scripts/ifcfg-eth0`

Now we need to edit the `/etc/httpd/conf/httpd.conf` to enable VirtualHosts and add to virtualhost references... one for the default host and one for our new virutal domain.

Edit `/etc/httpd/conf/httpd.conf` and add the following lines at the bottom of the configuration:

```
<VirtualHost 192.168.122.1xx:80>
     ServerName kvm-lastname.localdomain
     DocumentRoot /var/www/html
</VirtualHost>

<VirtualHost 192.168.122.1xx:80>
     ServerName www.testdomain1.com
     DocumentRoot /var/www/testdomain1
     CustomLog logs/testdomain1-access_log combined
     ErrorLog logs/testdomain1-error_log
```

```
</VirtualHost>
```

Make sure any DocumentRoot directories you refer to exist:

```
mkdir /var/www/testdomain1
```

Put an `index.html` page in the `testdomain1` directory

```
nano -w /var/www/testdomain1/index.html
```
Add to it the line "Hello from testdomain1" and save.

Restart the webserver (`systemctl restart httpd.service`)

Browse to your new domain
`links` www.testdomain1.com
Did it work?

Installing PHP

```
dnf install php
```
After installing php do the following: `systemctl enable --now php-fpm.service`
Restart the webserver (`systemctl restart httpd.service`)

Put an `index.php` page into `/var/www/testdomain1` and put inside it the following:

```
<?PHP
phpinfo();
?>
```
Browse to the new domain again. Did it work? Why not?
Let's try our default domain instead.
Create an `index.php` file in `/var/www/html/` and put in the same sample php code shown above and then browse to your default domain.
`links` http://localhost/ or `links` http://kvm-lastname/
Which page showed up? The `index.html` or the `index.php` page?
Now explicitly browse to the `index.php` page.
`links` http://localhost/index.php or `links` http://kvm-lastname/index.php
Did it work?

Submitting Homework 5

You can find the instructions here as `/public/homework5.txt` on the course server. Feel free to copy it over to `/root/HOMEWORK/` on your student VM.